

U.S. Patent Application Serial No. 09/044,030

REMARKS

Applicants' attorney wishes to thank the Examiner for the courteous and helpful interview of June 30, 2003, during which the present claim amendments and the prior art were discussed.

Applicants only independent claim, Claim 13, is to a heat pipe cooler that includes a heat receiving plate that has upper and lower opposite surfaces with the lower surface of the heat receiving plate arranged to contact an element which generates heat and is to be cooled. A plurality of heat pipes are fixed to the upper surface of the heat receiving plate for thermal conduction, the plurality of heat pipes being upstanding with respect to the heat receiving plate, and the plurality of heat pipes are sealed at opposite end portions thereof. A plurality of parallel heat radiating plates are provided that are fixed to the plurality of heat pipes at positions along the plurality of heat pipes toward an end thereof, the parallel heat radiating plates extending substantially parallel to, and having a shape corresponding to the heat receiving plate. The distance between the heat receiving plate and one of the parallel heat radiating plates which is located adjacent the heat receiving plate is substantially greater than a distance between two adjacent parallel heat radiating plates. A ventilation duct is provided having an air inlet and air outlet surrounding the parallel heat radiating plates and defines a passage for air through a gap between the parallel heat radiating plates, and a fan is provided to produce a current of air through the duct.

Reconsideration and removal of the rejection of Claim 13 as being obvious in view of a combination of Sugawara (JP 2-93270) and Yamakage (JP 63-254754); and of Claims 14 and 16 as

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obvious in view of those references when combined with Inoe (JP 61-130789) or Ishida (JP 03-096258), are respectfully requested in view of the following remarks.

In the Office Action it is alleged that Sugawara discloses in Figures 1 and 2 the invention claimed, except for a fan and a plate having a plurality of heat pipes.

As discussed, beginning at page 1 of the present specification, Sugawara shows a cooling mechanism that has cooling units disposed in an air duct, where each cooling unit has a straight bar-shaped heat pipe with one end embedded and fixed in a heat generating element and the other end extending across a duct and has spaced, parallel square-shaped fins, with the end extending through the fins.

In Sugawara, there is no fan as admitted in the Office Action. In addition, there is no heat receiving plate, at all, which has an upper and a lower surface, but a heat generating body 1 for each heat pipe. There are thus no plurality of heat pipes upstanding with respect to a heat receiving plate as in present Claim 13. There are thus no parallel heat radiating plates having a shape corresponding to a heat receiving plate as in present Claim 13. There is thus no greater distance between a heat receiving plate and an adjacent heat radiating plate than between two adjacent heat radiating plates as in present Claim 13.

The Office Action then cites Yamakage to show use of a fan (8) and a plurality of heat pipes (4) attached to a block (2). As discussed on page 1 of the present specification, Yamakage shows a cooling apparatus that has a straight bar-shaped heat pipe, with one end embedded and fixed in a metal block. The other end of the heat pipe has a plurality of disc-shaped fins on the outer surface, which are parallel and spaced apart, with the heat pipe extending through the center of the fins. In

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Yamakage, however, a plurality of heat pipes are not upstanding from an upper surface of a heat receiving plate as in present Claim 13. The heat pipe (9) is embedded in a hole (3) of the metal block (2). Again, the heat radiating plates or fins in Yamakage are not in a shape corresponding to the heat receiving plate (2) as in present Claim 13.

Neither Sugawara nor Yamakage teach or suggest (1) a heat receiving plate; (2) a plurality of heat pipes fixed to an upper surface of a heat receiving plate; (3) a plurality of heat pipes being upstanding with respect to a heat receiving plate which are sealed at opposite end portions; (4) parallel heat radiating plates having a shape corresponding to a heat receiving plate; or (5) a distance between a heat receiving plate and one of parallel heat radiating plates adjacent the heat receiving plate being substantially greater than a distance between two adjacent parallel heat radiating plates. One would not be led to the heat pipe cooler of Claim 13 without first reviewing Applicants' specification. The references themselves do not lead one to the construction claimed.

Claims 14 and 16 are rejected on the basis of the Sugawara-Yamakage combination with the addition of the teachings of either Inoue, JP 61-130789 ('789) or Ishida, JP 03-096258. The latter two references are cited to show fins attached across each end of a heat pipe. They do not, however, supply the deficiencies of the Sugawara-Yamakage combination described above.

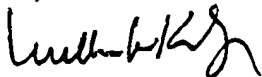
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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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